



**International
Energy Agency**

Secure
Sustainable
Together

Energy Efficiency in Buildings Policy Tools

*Energy Efficiency Databases and the
Multiple Benefits of Energy Efficiency*

- **Policies and Measures database**
 - Global database that documents energy efficiency policies
- **Building Energy Efficiency Policies database**
 - Global database that includes details on building codes, labels and incentive policies
- **Energy Efficiency Indicators database**
 - Global database of practices on collection of data for developing energy efficiency indicators
- **The Multiple Benefits of Energy Efficiency**



IEA's Policies and Measures database

PAMS

PAMS database: Policies & Measures



Addressing Climate Change Database

The Dealing with Climate Change policies and measures database provides information on energy-related policies and measures taken or planned to reduce greenhouse gas emissions.



IEA/IRENA Global Renewable Energy Policies and Measures Database

The IEA/IRENA Global Renewable Energy Policies and Measures Database provides information on policies and measures taken or planned to encourage the uptake of renewable energy in all IEA and IRENA Member countries and signatories.



Energy Efficiency Database

The Energy Efficiency Policies and Measures database provides information on policies and measures taken or planned to improve energy efficiency. The database further supports the IEA G8 Gleneagles Plan of Action mandate to "share best practice between participating governments", and the agreement by IEA Energy Ministers in 2009 to promote energy efficiency and close policy gaps.



Building Energy Efficiency Policies (BEEP) Database

The BEEP database was launched in 2012 as part of the work of the IEA's Sustainable Buildings Centre (SBC). It provides a detailed breakdown of policies for energy efficiency in buildings around the world, including those supporting buildings codes, labels, incentive schemes and zero-energy buildings.

PAMS database: Energy Efficiency Policies & Measures

www.iea.org



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

PAMS database: Energy Efficiency Policies & Measures

www.iea.org

Advanced search

Countries

- + Regions
- + Countries

25 Energy Efficiency Recommendations

- ☐ Appliances and equipment
- ☒ Buildings
- ☐ Cross-sectoral
- ☐ Energy Utilities
- ☐ Industry
- ☐ Lighting
- ☐ Transport

Policy Status

- ☐ Ended
- ☐ In Force
- ☐ Planned
- ☐ Superseded
- ☐ Under Review

☐ Search only recently updated policies

Policy Type

- + ☐ Economic Instruments
- + ☐ Information and Education
- + ☐ Policy Support
- + ☐ Regulatory Instruments
- + ☐ Research, Development and Deployment (RD&D)
- + ☐ Voluntary Approaches

Effective between

Select ▼ and Select ▼

Search by keyword(s)

Energy Efficiency Policy Targets

- + ☐ Buildings
- + ☐ Commercial/Industrial Equipment
- + ☐ Energy Utilities
- + ☐ Industry
- + ☐ Lighting
- + ☐ Residential Appliances
- + ☐ Transport

Jurisdiction

- ☐ International
- ☐ National
- ☐ State/Regional
- ☐ Municipal

Buildings

- 6** Mandatory building codes and MEPS
- 7** Netzero energy consumption in buildings
- 8** Improved energy efficiency in existing buildings
- 9** Building energy labels or certificates
- 10** Energy performance of building components and systems



PAMS database: Energy Efficiency Policies & Measures

www.iea.org

Filter:

TITLE	COUNTRY	YEAR	POLICY STATUS	POLICY TYPE	POLICY TARGET
SaskPower_Compressed Air System Program	Canada	2016	In Force	Economic Instruments>Fiscal/financial incentives	Industry>Energy management, Buildings>Building Type>Residential
Nova Scotia Appliance Retirement (Efficiency NS)	Canada	2015	In Force	Voluntary Approaches, Economic Instruments, Economic Instruments>Fiscal/financial incentives	Buildings, Buildings>Building Type, Buildings>Building Type>Residential, Residential Appliances, Residential Appliances>Refrigeration, Residential Appliances>Space cooling
Saskatchewan Refrigerator Recycling Program (SaskPower)	Canada	2015	In Force	Voluntary Approaches	Residential Appliances, Residential Appliances>Refrigeration, Buildings>Building Type, Buildings>Building Type>Residential
Québec Farming Products Program	Canada	2015	In Force	Economic Instruments>Fiscal/financial incentives	Commercial/Industrial Equipment>Other
Ontario Showerhead Rebate Program (Enbridge)	Canada	2015	In Force	Economic Instruments, Economic Instruments>Fiscal/financial incentives	Residential Appliances, Residential Appliances>Other, Energy Utilities>Demand-side management/End-use services
Green Municipal Fund (GMF)	Canada	2015	In Force	Economic Instruments>Fiscal/financial incentives>Grants and subsidies, Economic Instruments>Fiscal/financial incentives>Loans	Industry>Energy management, Buildings>Building Type>Non-residential
Ontario SaveOnEnergy Coupons	Canada	2015	In Force	Economic Instruments>Fiscal/financial incentives, Economic Instruments	Lighting, Lighting>Residential, Residential Appliances, Residential Appliances>Ventilation, Residential Appliances>Space heating, Buildings>Building Type>Residential
Nova Scotia Small Business Energy Solutions (Efficiency NS)	Canada	2015	In Force	Economic Instruments, Economic Instruments>Fiscal/financial incentives, Information and Education, Information and Education>Professional training and	Buildings, Buildings>Building Code, Buildings>Building Code>Energy performance, Residential Appliances, Commercial/Industrial Equipment, Energy Utilities, Energy Utilities>Heating

PAMS database: Energy Efficiency Policies & Measures

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Country:	Denmark
Year:	2013
Policy status:	In Force
Jurisdiction:	National
Date Effective:	2013
Policy Type:	Regulatory Instruments, Regulatory Instruments>Codes and standards, Regulatory Instruments>Codes and standards>Building codes and standards
Policy Target:	Buildings, Buildings>Building Code
URL:	http://byggningsreglementet.dk/
Legal References:	Law no. 1185 of 14/10/2010
Description:	<p>Building codes for new buildings were tightened in several stages in 1977, 1985, 1996 (large buildings) and 1998 (small buildings). The 1996 and 1998 codes were designed to cut an additional 25% off net heating demand, reducing it to about 70 kWh per square metre per year. The code also sets limits on electricity consumption for ventilation and will enforce low temperature heating systems to increase the efficiency of various heat supply systems, such as district heating systems, condensing boilers, solar energy and heat pumps. A further reduction to 45 kWh per square metre was scheduled to enter into force around 2005. Buildings respecting this limit through combined exploitation of passive solar techniques, insulation and coated glazing are already being built.</p> <p>Building codes were tightened in several stages by 2013. The Danish building code is among the strictest in the world. The building code contains three performance levels: minimum requirements, a voluntary building class 2015, and a voluntary building class 2020. The main requirement is on energy performance for the building as a whole. It is supplemented by rather detailed requirements on the building envelope and on installations, for instance minimum requirements on thermal resistance of different parts of the building envelope, on air tightness of the building envelope as a whole, on efficiency of boilers, energy performance of windows etc.</p>
25 Energy Efficiency Recommendations Applied:	Buildings, Buildings, Improved energy efficiency in existing buildings, Buildings, Mandatory building codes and MEPS

[Browse building codes for Denmark](#)



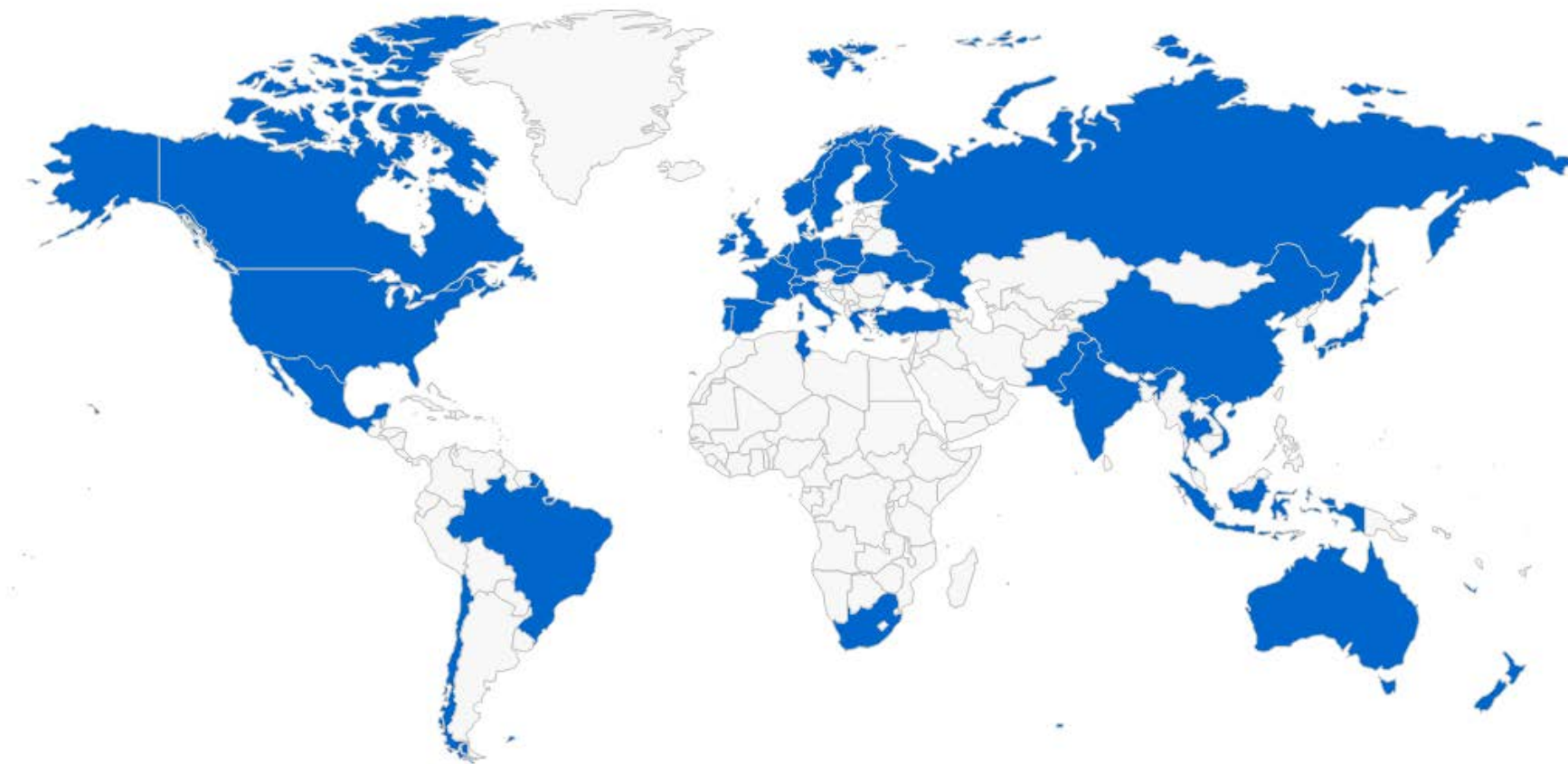
IEA's Building Energy Efficiency Policies database

BEEP

BEEP database: Building Energy Efficiency Policies

www.iea.org

IEA Building Energy Efficiency Policies Database



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BEEP database: Building Energy Efficiency Policies

Policies

Codes

Alberta Building Code 2011	New residential	Alberta
National Building Code of Canada 2010	New residential, New non-residential, Existing residential, Existing non-residential	Canada
National Energy Code of Canada for Buildings 2011	New residential, New non-residential	Canada
Ontario Supplementary Standard SB-10 2011	Existing non-residential, Existing residential, New non-residential, New residential	Ontario
Ontario Supplementary Standard SB-12 2011	Existing residential, New residential	Ontario
Quebec E-1.1 2012	New residential, Existing residential	Quebec

Labels

BOMA BESt (Building Environmental Standards) Version 2
ENERGY STAR Portfolio Manager Benchmarking Tool
LEED Canada (2009)
LEED Canada (Existing Building: Operations & Maintenance)

Incentives

ecoENERGY Retrofit (2007)

BEEP database: Building Energy Efficiency Policies

Prescriptive Compliance path

Prescriptive Compliance Path

Prescriptive requirements apply to building envelope components, heating ventilating and air conditioning equipment, and potable water heating equipment.

Energy Requirements:

Insulation

Building assemblies above ground:

U-Values (W/m2.K)	Floors	Roofs, Attic	Roofs, Other	Walls
Climate zone 4	0.214	0.145	0.214	0.360
Climate zone 5	0.214	0.115	0.214	0.325
Climate zone 6	0.214	0.115	0.214	0.325
Climate zone 7A	0.199	0.096	0.199	0.325
Climate zone 7B	0.199	0.096	0.199	0.385
Climate zone 8	0.199	0.096	0.199	0.385

Building assemblies in contact / below the ground:

U-Values (W/m2.K)	Floors, heated	Floors, above the frost lint	Roof	Walls
Climate zone 4	0.431	0.510	0.510	0.503
Climate zone 5	0.431	0.510	0.510	0.336

Performance Compliance path

Energy Performance Compliance

Performance compliance calculations determines the annual energy consumption of a reference house and sets the minimum energy target for the proposed house to that level.

Energy Requirements:

Insulation

Reduction is limited by health and safety requirements.

Windows

Where fenestration and door to gross wall area is less than 17%, the reference house is set to 17%. Where fenestration and door to gross wall area is greater than 22%, the reference house is set to 22%.

Air Leakage

An assumed building airtightness of 2.5 air changes per hour (ACH) is applied to the reference house. The proposed can measure airtightness or use an assumed 2.5 ACH in the simulation.

Space Heating System

Reference house applies a prescriptive type system for the applicable fuel type

Space Cooling System

Reference house applies a prescriptive type system for the applicable fuel type

Water Heating System

Reference house applies a prescriptive type system for the applicable fuel type

Compliance Softwares:

All energy modelling software used for code compliance calculations must conform to ANSI/ASHRAE 140, "Evaluation of Building Energy Analysis Computer Programs"

End-uses considered:


Space cooling, Space heating, Ventilation, Water heating



IEA's Energy Efficiency Indicators database

DATA AND INDICATORS

Energy Efficiency Indicators Statistics: Country Practices Database

A supplement to the publication [Energy Efficiency Indicators: Fundamentals on Statistics](#) , this database presents practices on collection of data for developing efficiency indicators from a variety of OECD Members and non-Members.

Practices are searchable by country and territory, sector, methodology and type of available documentation. By sharing these experiences, we hope to help countries and organisations to develop their own energy efficiency indicators programmes.

Countries and territories

- ☐ Albania
- ☐ Australia
- ☐ Austria
- ☐ Belgium
- ☐ Bosnia and Herzegovina
- ☐ Brazil
- ☐ Bulgaria
- ☐ Canada
- ☐ China

Sector

- ☐ Industry
- ☐ Residential
- ☐ Services
- ☐ Transport

Methodology

- ☐ Administrative sources
- ☐ Measuring
- ☐ Modelling
- ☐ Surveying

Available content

- ☐ methodology
- ☐ project web site
- ☐ questionnaire
- ☐ report
- ☐ results

Search by keywords

Reset

Search







Energy Efficiency Indicators Statistics: Country Practices Database

112 results found

(Tip: sort columns by clicking on the column header)

[Perform another search](#)

Filter:

PRACTICE	COUNTRIES AND TERRITORIES	SECTOR	METHODOLOGY	AVAILABLE CONTENT
R/Ad/01	Albania 	Residential	Administrative sources	
R/Ad/02	Belgium 	Residential	Administrative sources	
R/Ad/03	Norway, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Norway, Portugal, Romania	Residential	Administrative sources	project web site
R/Ad/04	Bosnia and Herzegovina 	Residential	Administrative sources	
R/Ad/05	Canada 	Residential	Administrative sources	results
R/Ad/06	Czech Republic 	Residential	Administrative sources	
R/Ad/07	Denmark 	Residential	Administrative sources	report

Energy Efficiency Indicators

www.iea.org

Data collection

Sample design	Stratified random sampling approach
Sample sources	National census, lists of telephone numbers
Sample/Population size	5 300 / 2 450 000
Response rate	40%
Time to complete	90 minutes
Mandatory	No
Incentive	Cash or other monetary incentives to responders, non-cash incentives
Survey respondents	Households
Elements collected	Dwelling type, dwelling floor area, building age, household occupancy, income, identification of main appliances, number of light fixtures, types of lighting, energy-related renovations, renewable equipment, residential energy consumption
Collection methods	Paper form sent by mail Internet based
End uses covered	Space cooling, space heating, water heating, lighting, refrigerators, freezers, dishwashers, washing machines, clothes dryers, televisions, computers, other small appliances
Frequency	Every two years

Comments

Main challenges

Inconsistent responses
Response quality
Quality of the interviewing staff

Available documentation

Project website: [Commercial Buildings Energy Consumption Survey \(CBECS\)](#)
Questionnaire: [Survey forms](#)
Results: [CBECS data](#)
[CBECS methodology](#)
[CBECS background and technical information](#)

Links to actual survey policies and documents that can be useful for when you create your own data collection.

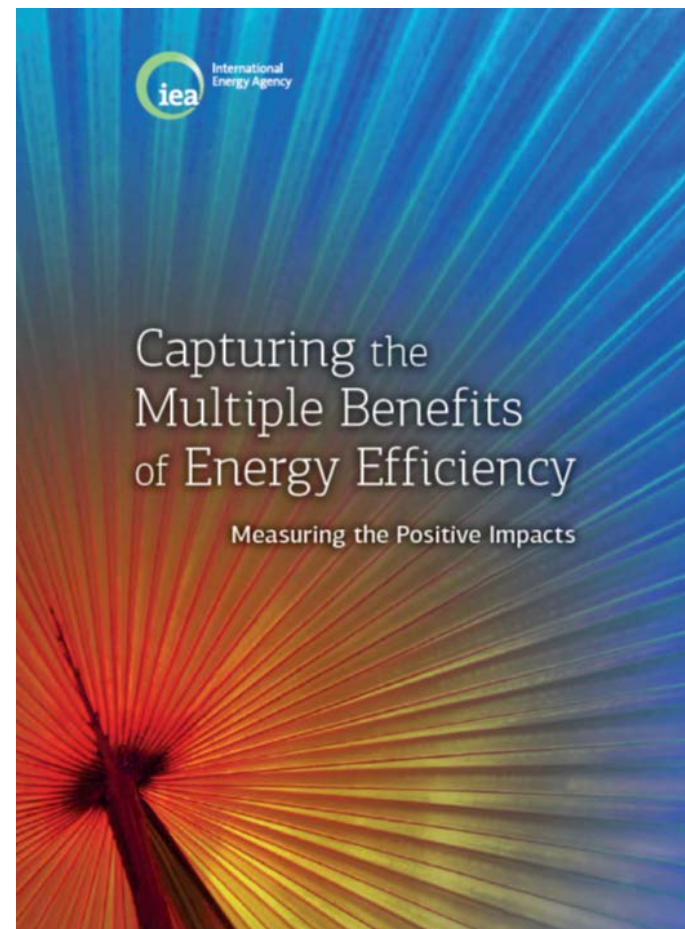
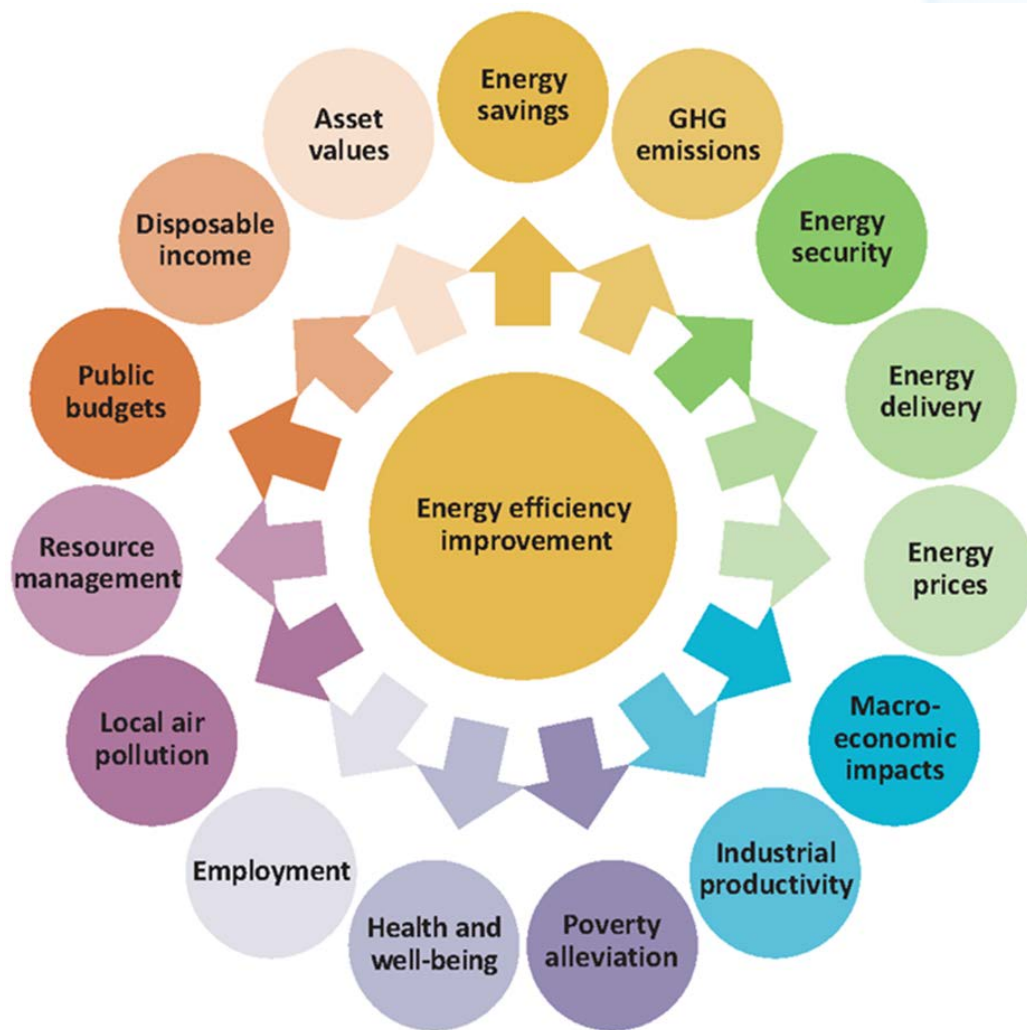


The Multiple Benefits of Energy Efficiency

MULTIPLE BENEFITS

Multiple Benefits of Energy Efficiency

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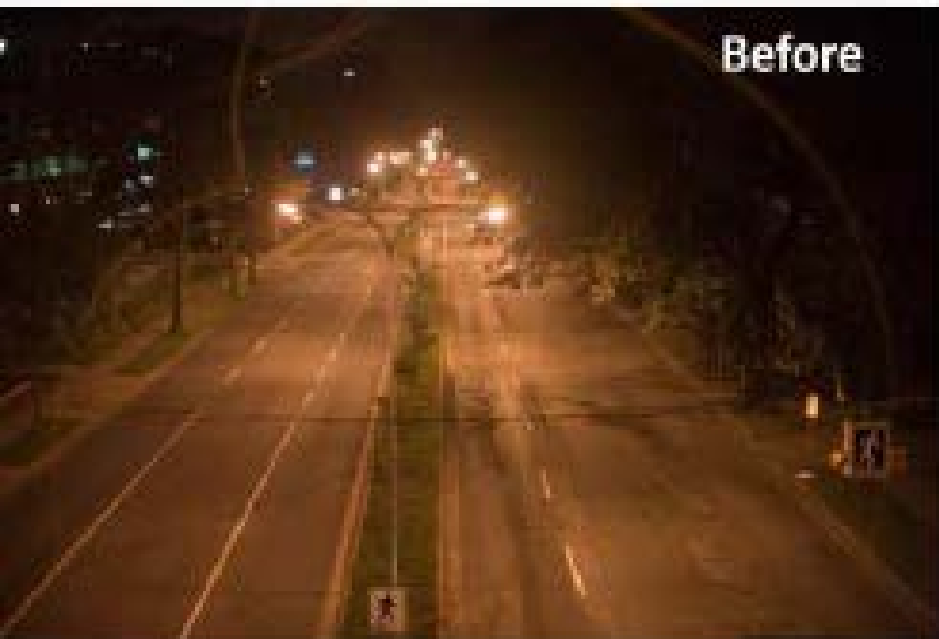


Free download: www.iea.org/publications/freepublications/

Multiple Benefits of Energy Efficiency: *Lighting*

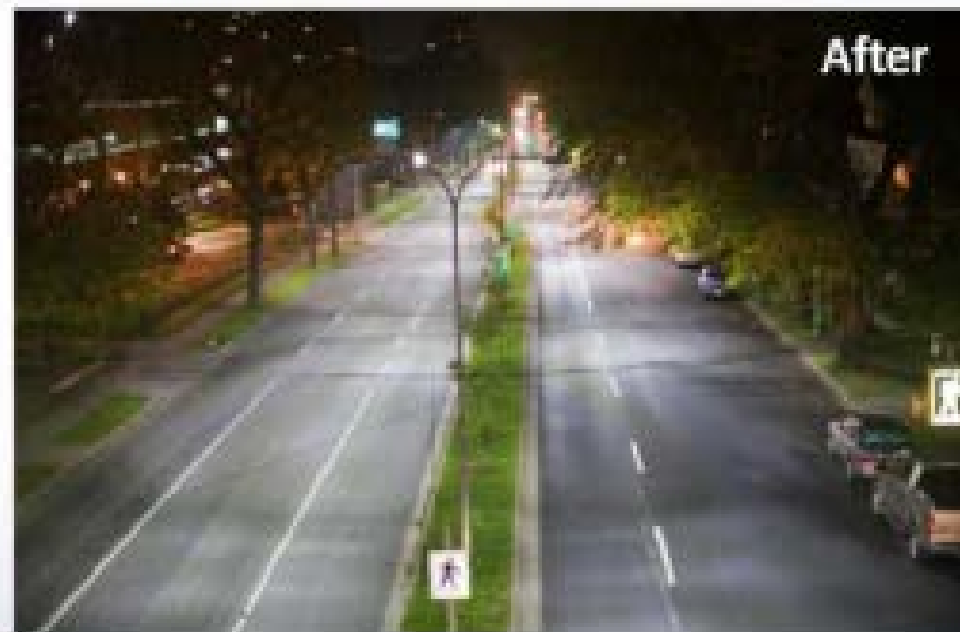
www.iea.org

Poor visibility



More energy use

Better light quality

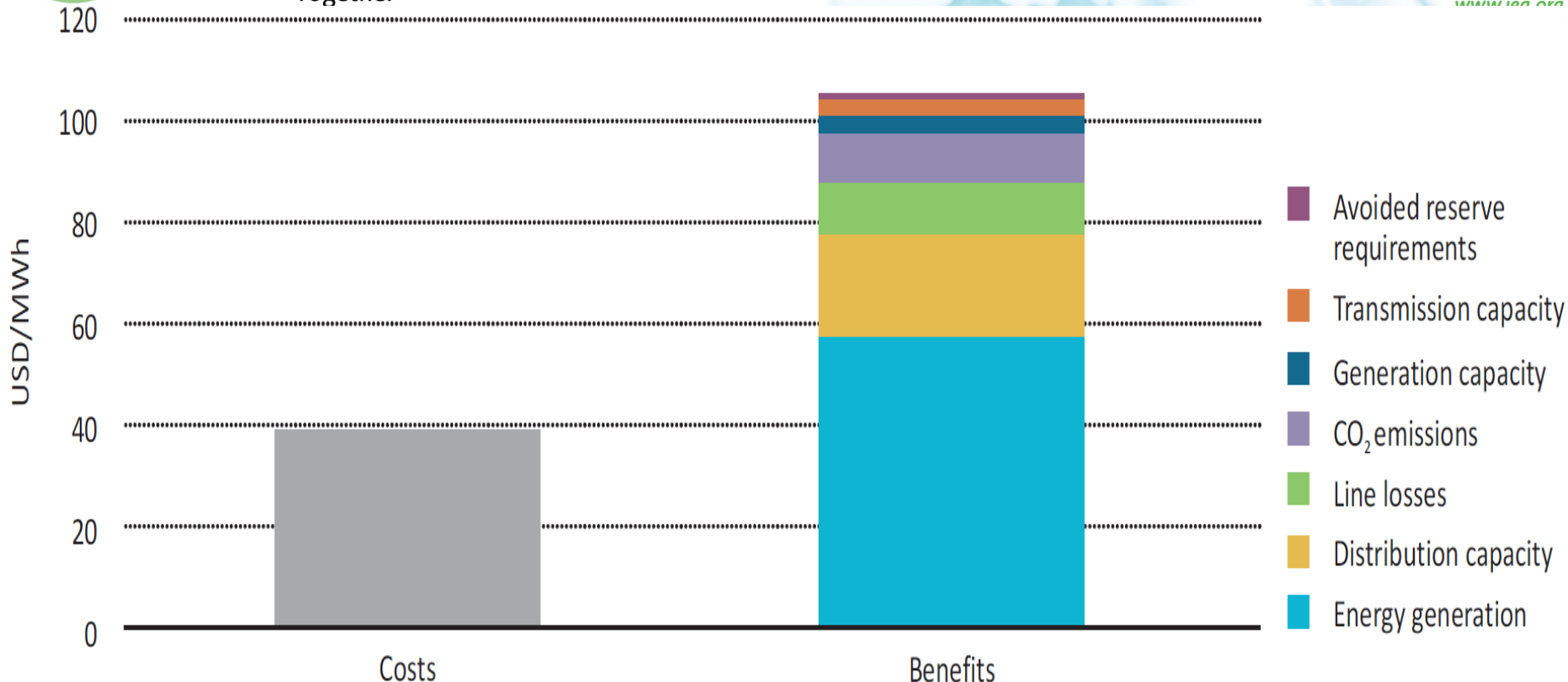


Less energy use

➤ Improved lighting has *improved safety* in Nova Scotia, Canada

Multiple Benefits of Energy Efficiency: *Energy Provider Perspective*

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- ***Benefits for utilities: cost and operational benefits in a resource constrained operating context***
- ***Benefits for consumers/indirect benefits for utilities: increased affordability reduces customer default and associated costs***

Multiple Benefits of Energy Efficiency: *Owner and Occupant Perspective*

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Comfort	Improved lighting comfort, thermal comfort and noise comfort
Health	Improved physical and mental health from indoor air quality and comfort.
Operations and maintenance	Improved building and systems durability with reduced need for maintenance.
Safety	Improved safety through lighting, controls and reduced chance of fire from gas leaks.
Property Value	Increased rental income, reduced tenant turnover, increased habitable floor area.

- **Benefits for owners: increased quality & property value**
- **Benefits for occupants: increased health, comfort, safety and affordability**

Multiple Benefits of Energy Efficiency:

Industry Perspective

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Competitiveness	Ability to enter new markets, reduced production costs, etc.
Production	Capacity utilisation, improved product quality, etc.
Operations and maintenance	Improved industrial and commercial operation; reduced need for maintenance, etc.
Working environment	Site environmental quality, worker health and safety, etc.
Environment	Air pollution, solid waste, wastewater, reduced input materials, etc.

- **Benefits for industry: increased productivity & value creation**
- **Benefits for consumers/indirect benefits for industry: increased affordability and access to products and services**

Multiple Benefits of Energy Efficiency:

Societal Perspective

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Jobs	Shifting from global to local jobs and from polluting to green jobs
Economic	Investment that provides economic benefit for many years.
Emissions	Reduced direct and indirect emissions from efficiency, refrigerants and reduced product size / quantity.
Energy	Energy use benefit from improved efficiency and reduced embodied energy from increased durability
Environmental	Air pollution, solid waste, wastewater, and reduced input materials

➤ **Benefits:** ability to shift investments into energy efficiency that provide multiple benefits for years.

Multiple Benefits of Energy Efficiency:

Country Perspective - Supporting Development

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Energy access	Expand access to supply power to more people through the existing energy infrastructure.
Economic development	Supporting economic growth including through industrial productivity and reducing fuel import bills.
Poverty alleviation	Increasing the affordability by reducing the per-unit cost of lighting, heating, refrigeration, etc.
Combatting local pollution	Reducing direct and indirect emissions through energy efficiency on supply side and demand side.
Climate change resilience	Reducing vulnerable energy infrastructure and improving the durability of buildings .

➤ **Benefits: Multiple benefits are of particular importance for emerging economies and developing countries.**

Multiple Benefits of Energy Efficiency:

Macroeconomic impacts on public budgets

www.iea.org

Sales tax revenue from sales of energy efficient products and services

Income



Sales tax revenue from other goods when crowded out by energy efficiency

Income



Initial costs of public investment in energy efficiency products and services

Expense



Expenditures on health, social welfare and unemployment benefits

Expense



Revenues from real estate transactions if properties become more valuable

Income



Multiple Benefits of Energy Efficiency:

Macroeconomic impacts on public budgets

Expenditures on public sector energy consumption

Expense



Energy subsidies to final consumers

Expense



Energy excise duty, emissions trading, and carbon tax revenues

Income



Sales and income tax revenues from sales of goods and services

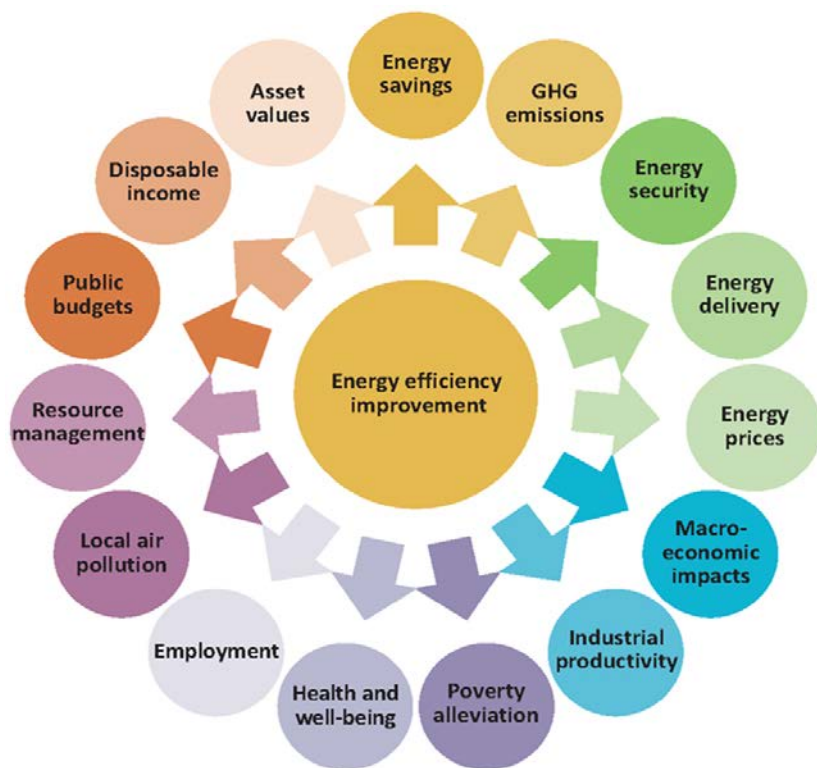
Income



Public investment in energy supply infrastructure and subsidies

Expense





Energy Efficient Prosperity

Energy efficiency as a means to support economic and social development.



GLOBAL ENERGY EFFICIENCY ACCELERATOR PLATFORM

Tools for Building Energy Efficiency: Resources for Policy Design

March 31, 2016

Building Efficiency Accelerator Webinar Series



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